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Healthy Whole Wheat — Elementary School Education Project

Executive Summary

Introduction

Considerable scientific evidence suggests that eating whole grains such as whole wheat reduces the risk for heart disease, type 2 diabetes, obesity, and certain cancers. A Healthy People 2010 objective establishes a recommended intake of three servings of whole grains per day. At present, few children in the United States are meeting these recommendations. School meals represent a strategic point of intervention for children, because the majority of schools in the United States participate in the National School Lunch Program.

Project Objective

The objective of the whole wheat project was to determine the effectiveness of an intervention involving education and promotion of whole wheat products on increasing students' selections of whole wheat products in the school lunch room. This project was conducted with fourth and fifth grade students at an elementary school in central Pennsylvania during the fall of 2008.

Methodology

The project involved a classroom education group, a cafeteria promotions group and a comparison group. Half of the fourth and fifth grade classrooms at one elementary school were randomly assigned to the education group and the other half to the cafeteria promotions group. Fourth and fifth grade students from another elementary school in the same school district were included as a comparison group. The research team developed lessons about whole wheat which were coordinated with the offering of whole wheat food choices in the cafeteria.

- For the classroom education group, the teachers were asked to conduct one 15–30 minute lesson per week for four weeks. Each lesson included an outline and background materials for use by teachers to conduct the lessons, a classroom poster emphasizing main lesson messages, mini posters to take home and taste tests of whole wheat products. The students in the classroom education group were also exposed to cafeteria promotions which included the same posters that were displayed in the classroom and cafeteria.
- For the cafeteria promotion group, the same posters that were posted in the classrooms were displayed in the cafeteria. Students in this group did not receive in-class education.
- Students in the comparison group were not exposed to cafeteria promotions or classroom lessons.

Evaluation

On evaluation days, students in the two interventions and one control group were asked at the point of service if they wanted whole wheat or white choices for one main entrée and two other alternative choices. A record was kept by food service workers of the number of students who selected each option. This process was observed by a member of the research staff. Data was collected on three consecutive pre-test, four intervention, and three post-test episodes, all consecutive and at one week intervals.



Results

Table :
Percentage of students who selected whole wheat items in the cafeteria.*

GROUPS	Pre-Intervention			Intervention				Post-Intervention		
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Education	14%	7%	5%	60%	67%	79%	82%	61%	50%	44%
Cafeteria	7%	5%	13%	18%	25%	24%	22%	27%	12%	5%
Comparison	7%	6%	8%	11%	11%	13%	4%	10%	4%	4%

** Out of 136 students recruited, 134 students participated in the research for a response rate of 98.5 %.*

What We Learned

- Students who receive educational lessons are more likely to choose whole wheat food choices in the cafeteria.
- Exposing students to informational posters on whole wheat can influence student choices to some extent as well.



Session #1: The Whole Wheat Kernel

Materials for Teachers:

High-resolution photographs (5) of the components of wheat

Materials for Students:

Handout: *The Whole Wheat Kernel*

Material for Classroom:

Poster: *Things to Remember About Whole Wheat*

Objective:

Students will be able to:

Identify and state different components of the wheat kernel

I. Prior to Session

- Display the *Things to Remember About Whole Wheat* poster in a prominent location in the classroom.

II. Introduction

- Tell students that the main purpose of the session is to become familiar with the whole wheat kernel and learn about its different components.
- Tell them that this knowledge will help them learn to make healthy food choices.

III. Session Activities: The Whole Wheat Kernel

- Ask students if they have ever seen, touched or tasted a wheat kernel. Discuss.
- Distribute the *Whole Wheat Kernel* handout to students. Discuss the different components of the whole wheat kernel (i.e. bran, endosperm, and germ) by allowing the students to look at the handout sheet. Pass out the high-resolution photographs and have the students pass the photographs around and note the differences of the various components of the wheat kernel.
- Ask students if they know what wheat flour is. How is it made? Flour consists of ground wheat kernels. Discuss the differences between whole wheat flour and white flour as per the information provided by the photographs. Explain that when whole wheat flour has the germ and bran removed it becomes white flour. Thus, you get less nutrition with white flour than with whole wheat flour.
- Tell students that whole wheat products or bread generally have much higher amounts of fiber, proteins, and trace minerals compared to white bread. **These differences enable whole wheat bread products to aid digestion, help the stomach feel full, fight obesity, and reduce the risk of cancer and diabetes.**
- Encourage students to consider making a commitment to choosing whole wheat products and to share what they have learned with their family and friends. Have the students repeat their commitment at the end of each successive lesson. This commitment could take various forms. For example, a show of hands, a brief written statement, or by recording actions which are relevant to the lessons.



Session #2: Whole Wheat Health Benefits

Materials for Teachers:

Handout: *Whole Wheat Kernel* (from Session #1)

Information sheet: *Whole Wheat Nutrients*

Materials for Students:

Handout: *Whole Wheat: Get the Healthy Choice*

Material for Classroom:

Poster: *Things to Remember About Whole Wheat*

Objective:

Students will be able to:

State the health benefits of whole wheat foods.

I. Prior to Session

- Display the *Things to Remember About Whole Wheat* poster in a prominent location in the classroom.

II. Introduction

- Review the components of whole wheat (i.e. bran, endosperm and germ) by referring to *The Whole Wheat Kernel* sheet from Session #1. Ask students if they remember the differences between white flour and whole wheat flour. Discuss their answers.
- Tell students that the main purpose of Session 2 is to learn about the nutritional and health benefits of whole wheat foods.

III. Session Activities — Whole Wheat: Get the Healthy Choice

- Ask students if they know any benefits of consuming whole wheat foods. Discuss their answers.
- Distribute handout: *Whole Wheat: Get the Healthy Choice* to students.
- Referring to the *Whole Wheat: Get the Healthy Choice* handout, discuss the nutrients that are commonly present in whole wheat and white bread. Then state that whole wheat has many health benefits. It has higher amounts of fiber, protein and other nutrients.
- Encourage students to look at the graph plots.
 - ★ Point out the different shades for the bars in the graphs. Determine which bar represents white flour and which represents whole wheat flour. Ask the students which bars are higher. Tell them that the higher bar means that whole wheat flour has more of those nutrients.
 - ★ Discuss that fiber and protein from the first bar graph are measured in different (larger) units than the others and that is why they are on a different graph.
 - ★ Tell them that fiber is important not only for their “digestive health” and to keep regular, but it has long-term benefits and has been shown to **reduce the risk of cancer and heart disease** as well as providing a sense of satiation which can help reduce obesity.



- ★ Protein is in both white and wheat flour and is the raw material to build muscles and other body tissues.
- ★ Eating meat provides more protein than eating bread, but bread does have some protein and is a good food because it also has the other nutrients you see on the second table.
- ★ The important point in the tables is that **whole wheat has more of almost every nutrient listed**. For additional information on the functions of the other nutrients, the *Whole Wheat Nutrients* information sheet has been included in the teacher materials.
- ★ Encourage the students to commit to eating whole wheat bread and to share their newfound knowledge with family and friends.



Whole Wheat Nutrients: Information Sheet

For Session #2

Riboflavin

Role: Riboflavin plays an important role in energy metabolism, aids in normal vision, and helps in maintaining health and integrity of the skin.

Sources: Meat, green leaves, milk, yogurt, and whole grain cereals

Vitamin B6

Role: Vitamin B6 helps to make red blood cells, facilitates metabolism, and aids in the absorption of fats and proteins in the body.

Sources: White beans, cabbage, whole grain cereals, avocados, walnuts, eggs, leafy green vegetables, meat, fish, sweet potatoes, and legumes

Thiamin

Role: Thiamin plays an important role in energy metabolism and supports appetite and the functions of the nervous system.

Sources: Whole grain cereals, beans, meat, fish, and poultry

Vitamin E

Role: Vitamin E facilitates resistance to diseases and protects cell structures in the body.

Sources: Whole grain cereals, leafy vegetables, peanuts, egg yolks, dark green vegetables, vegetable oils, seeds, and nuts

Niacin

Role: Niacin plays an important role in energy metabolism, aids in normal functioning of nervous and digestive systems, and supports integrity of skin.

Sources: Whole grain cereals, eggs, meat, poultry, fish, milk, and peanuts

Zinc

Role: Zinc helps maintain a healthy immune system and facilitates the digestion and transport of vitamin A.

Sources: Whole grain cereals, meat, chicken, fish, milk, nuts, garlic, oysters, egg yolks, legumes, leafy green vegetables, and seafood

Iron

Role: Iron helps to transport oxygen to the blood and builds new blood cells.

Sources: Poultry, meat, fish, liver, seafood, eggs, peanuts, beans, dried fruit, whole grain cereals, and alfalfa



Manganese

Role: Manganese is needed for normal utilization of several other vitamins in the body. It aids in proper fat metabolism, building skeletal and connective tissues, production of energy, proper brain function, and processing blood sugar.

Sources: Wheat bran, legumes, nuts, lettuce, leafy green vegetables, blueberries, pineapple, and seafood

Magnesium

Role: Magnesium aids in proper functioning of the nervous system. It helps in strengthening muscles, bone development, and teeth maintenance.

Sources: Seafood, dark green vegetables, cereals, nuts, and legumes



Session #3: Identifying Whole Wheat Foods

Materials for Teachers:

The School Lunch Menu

Materials for Students:

Handout: The School Lunch Menu

Handout: *Take a Look at Whole Wheat Bread Labels*

Material for Classroom: Poster: *Things to Remember About Whole Wheat*

Objective:

Students will be able to:

- Identify whole wheat containing food products on the school lunch menu.
- Identify whole wheat foods by examining food labels.

I. Prior to Session

- Obtain a copy of your school's lunch menu. Make copies for the students.
- Display the *Things to Remember About Whole Wheat* poster in a prominent location in the classroom.

II. Introduction

- Review and initiate a discussion about the main points from the previous sessions about the components of the whole wheat kernel; bran, endosperm and germ. Remind students that whole wheat has higher amounts of fiber, proteins, and nutrients as compared to white. Ask students if they remember anything about the health benefits of whole wheat. Discuss lowering the risk of many health problems by referring to the poster and the handout.

III. Session Activities — Good Health and Healthy Whole Wheat Nutrients

- Tell students that the objective of this activity is for each student to identify whole wheat food products on the school lunch menu.
- Tell students that they will also learn tips on how to identify whole wheat foods by looking at food labels.
- Tell students that in the past most cafeteria foods were made with white flour but food service people will be trying to add more whole wheat items in the future if students will accept them.
- Pass out the School Lunch Menu to students and ask students if they can identify menu items on the School Lunch Menu that **could be substituted** to include whole wheat products.



- Ask students if they have ever tasted whole wheat products other than bread. Discuss their response. You may choose to explain that other cereal grains can be either whole grain or refined the same way as wheat flour. For example, corn, barley, and brown rice are all examples of whole grains, and all can be ground into flour or processed into other products. Brown rice can become white rice, corn can become hominy, and barley can be “pearled.” Many foods are offered as whole grains or refined, and they lose the valuable germ and bran during refinement. Oats are the only cereal grain which are always offered whole, even when processed into “quick oats.”
- Distribute the handout *Take a Look at Whole Wheat Food Labels* to students.
- Encourage students to look at the examples of the ‘Ingredients’ list provided on the handout *Take a Look at Whole Wheat Food Labels*.
 - ★ Tell students that if bread is labeled “Wheat Bread” that does not automatically mean that they are getting a more nutritious product.
 - ★ Tell students that to make sure they choose a 100% whole wheat bread, they should always look at the first ingredient. Refer to the poster and tell students that the first ingredient should be listed as ‘Whole Wheat Flour’ or ‘Stone Ground Whole Wheat Flour’ or sometimes even ‘100% Whole Wheat Flour’ and ‘100% Stone Ground Wheat Flour’.
 - ★ Referring to the handout, tell students that some breads, which are believed to be whole wheat, are made with a combination of white and whole wheat flour and the ingredient list will list both. Inform students that these breads should not be mistaken for whole wheat breads.
 - ★ Tell students that sometimes bread labeled as “wheat bread” is really made with white flour with brown coloring added. This bread would not have the extra benefits of whole wheat bread. Inform students that these breads should not be mistaken for whole wheat breads.
- Discuss the ‘Clues to identify Whole Grain products’ provided on *Take a Look at Whole Wheat Bread Labels* handout with students.
 - ★ Explain how marketing and advertising is used to trick customers into believing that they are purchasing whole grain foods when they might not be.
 - ★ Quiz the students by asking them if bread is whole wheat if the label reads “100% wheat”, “multi-grain”, “contains whole wheat”, etc. **The point to stress is that the first ingredient should read “whole wheat flour” and that shoppers must carefully read labels to ensure that they choose healthful foods.**
 - ★ Use the *Things to Remember About Whole Wheat* poster to summarize the lessons
 - ★ Encourage the students to commit to choosing whole wheat bread and to sharing their knowledge with their friends and family. A possible exercise would be to have the students utilize their new-found knowledge of bread labels by quizzing their family members and reporting the results back to the class. Another exercise might be to have the students explain the benefits of whole wheat foods to their parents and to suggest to their parents to choose whole grain foods at the supermarket. The students could then share the results of this with the class either verbally or in a short paper.

